

CLAIMS

We claim:

1. 1. A spatial sound conference system comprising:
 2. a conference station comprising:
 3. right and left spatially disposed microphones connected to a communication channel for receiving right and left audio signals, wherein the differences between the right and left audio signals represent a head-related transfer function; and
 7. a remote station comprising:
 8. right and left spatially disposed loudspeakers connected to the communication channel.
1. 2. A spatial sound conference system according to claim 1, further comprising:
 3. a compression unit connected to the right and left spatially disposed microphones for compressing the right and left audio signals; and
 5. a decompression unit connected to the right and left spatially disposed loudspeakers for decompressing the compressed right and left audio signals.
1. 3. A spatial sound conference system according to claim 1, further comprising:
 3. a microphone positioned in the remote station and connected to the communication channel for receiving an audio signal; and
 5. a loudspeaker positioned in the conference station and connected through the communication channel to the microphone.

1 4. A spatial sound conference system according to claim 3, further
2 comprising:

3 a compression unit connected to the microphone positioned in the
4 remote station for compressing the audio signal; and

5 a decompression unit connected to the loudspeaker positioned in the
6 conference station for decompressing the compressed audio signal.

1 5. A spatial sound conference system according to claim 1, wherein the
2 right and left spatially disposed microphones are positioned on a dummy head.

1 6. A spatial sound conference system according to claim 5, further
2 comprising:

3 a microphone positioned in the remote station and connected to the
4 communication channel for receiving an audio signal; and

5 a loudspeaker positioned proximal to the dummy head and connected
6 through the communication channel to the microphone.

1 7. A spatial sound conference system according to claim 5, further
2 comprising:

3 a microphone positioned in the remote station and connected to the
4 communication channel for receiving an audio signal; and

5 right and left spatially disposed loudspeakers positioned in the
6 conference station and connected through the communication channel to the
7 microphone.

1 8. A spatial sound conference system according to claim 5, further
2 comprising:

3 a head-tracking sensor in the remote station connected to the
4 communications channel; and

5 a position simulator attached to the dummy head and connected through
6 the communication channel to the sensor.

1 9. A spatial sound conference system according to claim 1, further
2 comprising:

3 a video camera positioned in the conference station and connected to the
4 communication channel for receiving a video image; and

5 a display positioned in the remote station and connected through the
6 communication channel to the video camera.

1 10. A spatial sound conference system according to claim 9, wherein the
2 video camera is positioned near the location of eyes on a dummy head.

1 11. A spatial sound conference system according to claim 9, wherein the
2 display is a head-mounted display.

1 12. A spatial sound conference system according to claim 1, wherein the
2 right and left spatially disposed loudspeakers are a headset.

1 13. A method for conducting a spatial sound conference comprising the steps
2 of:

3 converting audio information into right and left audio signals at a
4 conference station, wherein the conversion imparts a differential characteristic
5 to the right and left audio signals, and the differential characteristic is
6 represented by a head-related transfer function, and the right and left audio
7 signals comprise spatialized audio;

8 transmitting audio information representative of said spatialized audio
9 from the conference station across a communication channel to a remote
10 station; and

11 playing the spatialized audio in the remote station.

1 14. A method for conducting a spatial sound conference according to claim
2 13, further comprising the steps of:

3 compressing the right and left audio signals after the step of converting;
4 and

5 decompressing the compressed right and left audio signals after the step
6 of transmitting.

1 15. A spatial sound conference system comprising:

2 a transmitting station comprising:

3 a microphone connected to a communications system for receiving
4 an audio signal;

5 a head-related transfer function unit connected to the communications
6 system for imparting a head-related transfer function to the audio signal to
7 produce a spatialized audio signal; and

8 a receiving station comprising:

9 right and left spatially disposed loudspeakers connected to the
10 communication system for receiving the spatialized audio signal.

1 16. A spatial sound conference system according to claim 15, further
2 comprising:

3 a compression unit connected to the microphone for compressing the
4 audio signal; and

5 a decompression unit connected to the head-related transfer function
6 unit for decompressing the compressed audio signal.

1 17. A spatial sound conference system according to claim 15, further
2 comprising:

3 a compression unit connected to the head-related transfer function unit
4 for compressing the spatialized audio signal; and

5 a decompression unit connected to the right and left spatially disposed
6 loudspeakers for decompressing the compressed spatialized audio signal.

1 18. A spatial sound conference system according to claim 15, wherein the
2 head-related transfer function unit is contained in a spatial sound conference
3 bridge.

1 19. A method for conducting a spatial sound conference comprising the steps
2 of:

3 receiving an audio signal at a transmitting station;

4 transmitting the audio signal from the transmitting station to a spatial
5 sound conference bridge;

6 imparting a head-related transfer function to the audio signal to create
7 a spatialized audio signal;

8 sending the spatialized audio signal from the spatial sound conference
9 bridge to a receiving station; and

10 playing the spatialized audio signal on spatially disposed loudspeakers
11 at the receiving station.

1 20. A method for conducting a spatial sound conference according to claim
2 19, further comprising the steps of:

3 compressing the audio signal after the step of receiving; and

4 decompressing the compressed audio signal after the step of
5 transmitting.

1 21. A method for conducting a spatial sound conference according to claim
2 19, further comprising the steps of:

3 compressing the spatialized audio signal after the step of imparting; and

4 decompressing the compressed spatialized audio signal after the step of
5 sending.

1 22. A method for conducting a spatial sound conference comprising the steps
2 of:

3 receiving an audio signal at a transmitting station;

4 transmitting the audio signal from the transmitting station to a
5 receiving station;

6 imparting a head-related transfer function to the audio signal to create
7 spatialized audio signal;

8 playing the spatialized audio signal on spatially disposed loudspeakers
9 in the receiving station.

1 23. A method for conducting a spatial sound conference according to claim
2 22, further comprising the steps of:

compressing the audio signal after the step of receiving; and decompressing the compressed audio signal after the step of transmitting.

24. A spatial sound conference bridge comprising:

at least two input ports for receiving at least two audio signals; a head-related transfer function unit connected to the at least two input ports for imparting a head-related transfer function to at least one received audio signal to produce at least one spatialized audio signal; and at least two output ports connected to the head-related transfer function unit for transmitting the spatialized audio signal.

1 25. A spatial sound conference bridge according to claim 24, further
2 comprising:

3 a decompression unit connected to at least one input port for
4 decompressing at least one audio signal.

1 26. A spatial sound conference bridge according to claim 24, further
2 comprising:

3 a compression unit connected to at least one output port for compressing
4 at least one spatialized audio signal.

1 27. A method for conducting a spatial sound conference comprising the steps
2 of:
3 receiving at least two monaural audio signals;
4 generating at least two sets of spatialized audio signals from the at least
5 two monaural audio signals using at least two head-related transfer functions;
6 compiling at least one composite signal from the at least two sets of
7 spatialized audio signals;
8 transmitting at least one composite signal to a location; and
9 playing at least one composite signal at the location.

00353614537 -00000000